THE FIRST STUDENT'S GUIDES TO NATURAL SCIENCES IN EIGTHEENTH-CENTURY HUNGARY: PHYSICOTHEOLOGY IN TRANSLATION

Réka LENGYEL

The European Tradition of Physicotheology

In his *Physikotheologie Ursprünge, Leistung und Niedergang einer Denkform*, Paul Michel outlines that, "*between about 1670 and 1750, a true protuberance of physicotheological studies of all kinds reaches the book market […] In addition to more general works (under titles such as Physico- or Cosmotheologia), there are those that focus on specific object areas: plants, animals, geology, mountains, magnetism, comets, meteorological phenomena, medicine/diseases, human emotions"*.[1] Michel draws attention to the fact that the basic ideas proclaimed by eighteenth-century physicotheology are not of recent origin. In the seventeenth and eighteenth century, thinkers have largely built on ideas which were present in the history of European philosophy from the very beginning. Their principles were firmly rooted in the pagan and Christian tradition, and the works of Greek and Roman authors as well as the teachings of Christian theologians served as a starting point for their reasoning. Accordingly, on the list of the most important physicotheological works published by Johann Albert Fabricius in his Derham-translation in 1730, which contains primarily books published in the seventeenth and eighteenth century, there are also the writings of Cicero, Seneca, and medieval theologians.[2] Consequently, Michel presents the relevant teachings of classical natural philosophy and medieval theology as antecedents of physicotheology, and discusses major authors separately. The presentation of the works of the seventeenth- and eighteenth-century English, German, Dutch and French authors shows that the arguments used by them has a long tradition. Michel highlights that the main theories of physicotheology has expanded over time, and that early modern scientific inventions could be easily integrated into the previously developed ideological framework.

A particular feature of the cultural history of the period is that in many cases, dissemination of scientific knowledge has been connected with the protection of faith.[3] Theologians themselves were involved in practicing or at least propagation of science. Their primary purpose was to restrain the spread of atheistic ideas. Their fundamental theory was that the sensible world (for example, the planetary movements, the growth of plants, the instinct of animals, the anatomy of man) is astonishingly well-functioning and functional. There is therefore a reasonable argument for the existence of God or Reason to recognize his omnipotence, wisdom, kindness and occasion for his praise and love for him. This approach

---

[1] MICHEL, Paul. *Physikotheologie Ursprünge, Leistung und Niedergang einer Denkform.* Zürich: Herausgegeben von der Gelehrten Gesellschaft in Zürich (Nachfolgerin der Gesellschaft der Gelehrten auf der Chorherrenstube am Großmünster) vormals zum Besten des Waisenhauses 171. Stück, 2008, p. 4.

[2] Ibid., p. 6.

[3] Cf. ASTON, Nigel. Intellectual challenges and the religious response. In: *Christianity and revolutionary Europe, 1750–1830*. Cambridge: Cambridge University Press, 2002, pp. 93–133.

has always been present in Christian thinking, but the results of scientific research have increasingly confirmed its evidentiary power. The discoveries in various fields have highlighted the perfection of the order of nature and that of all the creatures, so they assumed that the whole universe must be created only by the most perfect existence. This ideology has gained ground in both Catholic and Protestant theology, but the Protestants were more involved in its distribution. These theoretical explanations served as the basis for physicotheology which has been developed in England and has been widely spread among European Protestants. In my paper I intend to highlight some details of the reception of physicotheology in Hungary, looking in detail at four translations, made and printed in the last quarter of the eighteenth century.

School Education: Natural Sciences and Physicotheology in Hungary

In the eighteenth century, natural sciences were gaining ground in secondary and higher schools in the Kingdom of Hungary.[4] Some branches of science, astronomy, mathematics, physics, chemistry, biology, mineralogy, geology have been included in the field of natural philosophy. Both the rationalist and empiric tendencies appeared. Altough scholastic philosophy was dominant, it was replaced gradually by the ideas of seventeeth century philosophers, Descartes and Newton. In the preparation of this process, the Protestant and Evangelical lyceums (Bratislava, Košice, Prešov, Kežmarok, Levoča, Debrecen, Sárospatak, Cluj) were at the forefront. The importance of scientific education was recognized with some delay in Jesuit high schools, academies and the University of Trnava. In the second half of the century, several colleges created scientific collections, purchased or produced measurement and scientific instruments. There were also teachers in Trnava and Debrecen who presented scientific experiments. They encouraged their students to do their own research, to observe the natural environment. They tried to promote the application of new scientific knowledge in medicine, industry, agriculture. Textbooks were prepared for both Catholic and Protestant schools, almost without exception in Latin.

Physicotheological ideas have spread in Hungary primarily in the Protestant intellectual circles. Reformed Colleges sent their students to study trips abroad to take courses in philosophical and natural sciences at German, Swiss, Dutch or English universities. On their return to Hungary, they continued their life as clergymen, teachers, or physicians, and played an active role in the dissemination of popular scientific knowledge. The propagation of physicotheological theories served both to strengthen and protect the Christian faith as well as to improve the general cultural level in the smaller or wider communities.

The Reception of William Derham's Works in Benjámin Szőnyi's *Physics for Children*

Among the Reformed Colleges in the Hungarian Kingdom, it was that of Debrecen in which the most advanced trends of school education gained ground. The Debrecen College was the

4 Cf. KOSÁRY, Domokos. *Culture and society in eighteenth-century Hungary.* Photos by Gábor Barka; translated by Zsuzsa Béres. Budapest: Corvina, 1987.

most influential centre of the reception of William Derham's works in Hungary. In the College Library there are several copies of the translations of *Physico-theology: or a Demonstration of the Being and Attributes of God from His Works of Creation* (1713). The book includes sixteen sermons held by Derham in St. Mary-le-Bow Church, London, in the years 1711 and 1712. The first three major chapters are dedicated to physics, geography, and astronomy, while the fourth deals with zoology. Chapters 5 to 10 deal with mankind, the animal kingdom and that of the plants, while the last chapter is a summary.

In the first half of the eighteenth century, the most renowned professor of the college was György Maróthi (1715–1744).[5] He has studied in Switzerland (Zürich, Basel, Bern) and the Netherlands (Groningen, Amsterdam, Leyden, The Hague). In Debrecen, he taught mathematics, astronomy, law, classical literature, and rhetorics. One of Maróthi's most excellent students was Benjámin Szőnyi (1717–1794). He is the author of a book a particular importance concerning the Hungarian reception of physicotheology. Recent examination of this book revealed that Szőnyi can be considered one of the first translators of Derham's works in Hungary.

As his professor, Szőnyi also went on a study trip abroad from the Debrecen Reformed College. Between 1743 and 1745, he enrolled in various university courses in Oder-Frankfurt, Leiden, Utrecht. Following his return from the Netherlands, he became a parish minister in Hódmezővásárhely, and later on held offices at church administration. He wrote religious lyrical works, published in three volumes. His most popular book was the collection of songs for public worship, called *Szentek hegedűje* (*Violin of Saints,* 1762) which was published several times until 1869.[6] In 1774, he published a book entitled *Gyermekek fisikája (Physics for Children)*, in Bratislava.[7] This work consists of two parts. The first part is the translation of a text written by Charles Rollin (1661–1741). It is a chapter of Rollin's treatise on education, called *De la maniere D'enseigner et D'etudier es Belles-Lettres* (first edition: Paris, 1726–1728). The second part contains the original poems of Szőnyi which are based on William Derham's *Physico-Theology*.

Charles Rollin (1661–1741) took the leadership of the College of Beauvais from 1696.[8] He reorganized the school and his administration was distinguished by many reforms. The second half of his life was devoted to an extensive editorial activity. His major concerns

---

5 Cf. BOZZAY, Réka. The Influence of Dutch Universities on the Education of Seventeenth-Century Hungarian Intellectuals. In: ALMÁSI, Gábor, ed. *A Divided Hungary in Europe: Exchanges, Networks and Representations, 1541–1699, Vol. 1. Study Tours and Intellectual-Religious Relationships.* Cambridge: Cambridge Scholars Publishing, 2014, pp. 81–100, here: 92.

6 See KOOL, Anna Maria. Benjamin Szőnyi and the Szentek Hegedűje (The Violin of the Saints). In: *God Moves in a Mysterious Way: The Hungarian Protestant Foreign Mission Movement, 1756–1951.* Zoetermeer: Uitgeverij Boekencentrum, 1993, pp. 75–89.

7 ROLLIN, Charles, SZŐNYI, Benjámin. *Gyermekek Fisikája, avagy olly szép és hasznos tudomány 'sengéje, Mellyben Kevés példák által meg-mutattatik, mint kellessék szoktatni a' gyermekeket, és együgyü embereket, az Istennek sok féle Teremtéseiröl való kegyes és kedves elmélkedésekre.* Pozsony: Landerer Mihály, 1774.

8 WARNICK, Barbara. A Minor Skirmish: Balthazar Gibert Versus Charles Rollin on Rhetorical Education. In: HORNER, Winifred Bryan, LEFF, Michael, ed. Rhetoric and Pedagogy: Its History, Philosophy, and Practice: Essays in Honor of James J. Murphy. New York–London: Routledge, 2013, pp. 173–182. GILL, Natasha. Educational Philosophy in the French Enlightenment: From Nature to Second Nature. New York–London: Routledge, 2016, pp. 65–115, passim.

were education and ancient history. His major work, destined to pedagogues, is known under the abbreviated title of *Traité des études*. In the four volumes, Rollin synthesized his own educational experiences and those of others. His treatises met with great success, and has been partly translated in the European languages. The chapter number V. called *De la Philosophie* is divided in five sections. The section number IV. (*A inspirer du respect pour la Religion)* is dedicated to physicotheology as the author describes here the various miracles of nature. His aim is to show how God is concerned with human race as the contemplation of the universe invites men to the greater admiration for the greatness of Him. In the part entitled *Physique des Enfans* Rollin presents the planets, the different kind of flowers, fruits, trees, animals, and illustrates the utility of phisical observations.

As Benjámin Szőnyi informs us on the verso of the title page, his translation is based on the German version of Rollin's text published by Johann Albert Fabritius, along with the German translation of William Derham's *Physico-Theology* (Hamburg, 1730). In the Preface of his book directed to the "*Pious Reader"*, Szőnyi announces that his purpose was to compile a piece in Hungarian language, dedicated "*this beautiful and God-leading science".* In his opinion, Rollin's work shows the greatness of God through examining nature, and strength the reader in Christian faith. He affirms who believe that studying the Bible is enough to practice faith is totally wrong, because it is equally important to inspect created things more closely. It is also a mistake to affirm that scientific studies can only be conducted in school education. Szőnyi claims that it is important to draw the appropriate conclusions from the examination of nature, otherwise the belief in Christhian faith and principles may be faltering.

The preface is followed by the close translation of Rollin's work. There are only a few additions inserted by Szőnyi in the original text. In his version, the section on insects is longer, it contains an approx. 12 sheets length addition.[9] Some part of the inserted text is translated from the chapter on insects of Derham's *Physico-Theology*.[10] Some paragraphs may be considered as original, or a translation based on a yet unidentified source. In Rollin's work, the introduction on the bees, ants and silkworms is followed by the description of Antlion (*Myrmeleon formicarius),*[11] while Szőnyi mentions several other insect species: fireflies, locusts, butterflies, lice, wasps, bugs, spiders, etc. Szőnyi inserts also longer quotes from the chapter on insects of Pliny's *Naturalis historia,* as well as the description of two interesting objects. His source is Derham who refers to these authors and texts in the notes (*Appendix Seu Addenda Curiosa Omissorum Ad Annum Primum Miscellaneorum Medico-Physicorum Academiae Naturae Curiosorum in Sacro Romano-Germanico Imperio,* Wratislaviae, 1671, 3–4; Galenus, Libri XVIII de usu partium, end of chapter I).

In the second part of the book, Szőnyi publishes seven of his poems. The titles of the poems are as follows:

1. The Sky/Air (246 lines, pp. 87–96)
2. The Round Earth (556 lines, pp. 97–140)

[9] ROLLIN–SZŐNYI, *Gyermekek Fisikája* (note 7), pp. 39–64.

[10] DERHAM, William. *Physico-theology: or, a Demonstration of the Being and Attributes of God, from his Works of Creation.* London: W. Innys, 1713, pp. 397–432.

[11] ROLLIN, Charles. *De la maniere D'enseigner et D'etudier es Belles-Lettres.* Leyden: J. de Wetstein, 1759, pp. 167–173.

3. The Four Elements: Earth, Air, Water, Light (180 lines, pp. 141–155)

4. The Rainbow (40 lines, pp. 156–158)

5. The Night/Day Cycle, and the Winter/Summer Cycle (152 lines, pp. 158–164)

6. The Design of Human Body and the Divine Wisdom (212 lines, pp. 165–174)

7. Standing erect of the human body („positura"), its unity with the soul, and the nerves and the senses as natural bonds between body and soul (p. 175–191).

Szőnyi's poems may be regarded as physicotheological sermons or dissertations written in verse. In all of the seven poems he refers to a number of biblical places. One of the poems deserves special attention. The second poem is a unique work of the erudite Szőnyi. He added a lot of notes to this text, which contain many Latin quotations from the works of Cicero, Seneca, Virgil, Ovid, Pliny, Marcus Manilius, Hugh of Saint Victor (*Didascalion,* 12th century), John Owen (*Epigrammata*), Hugo Grotius, Bernhard Varen (*Geographia generalis,* 1650), Gerrit Janszon Vos (Gerardus Vossius, *De theologia gentili, et physiologia christiana,* 1600), Philipp Clüver (*Introductio in Universam Geographiam,* 1624), Fontenelle (*Entretiens sur la pluralit des mondes,* 1686, Gottsched's edition 1727). Taking account also of the poem number 7 and a closing quotation, the list of these authors may be completed with the names of Juvenal, Giovanni Alfonso Borelli (*De Motu Animalium, I–II,* 1680–1681), Caspar Bartholin the Elder (*Anatomicae Institutiones Corporis Humani,* 1611) and Jean Alphonse Turrettini (*De existentia Dei,* 1730). An interesting feature of poem nr. 3 is the insertion of a long quotation from the geographical work of David Fröhlich (*Cynosura seu Bibliotheca Viatorum,* Ulm, 1644). Fröhlich (1595–1648), a matematician, astronomer, calendar maker and geographer was born in Kežmarok. His *Cynosura seu Bibliotheca Viatorum* contains his observations made when he climbed the Késmárk Peak (Kežmarký stít, 2558 m) of High Tatra in 1615. Szőnyi states that Fröhlich's description of this experience merits to be published also in Hungarian beacuse it became very famous among European scholars (it is cited also in Varen's *Geographia*).

However, in Szőnyi's notes, that name which occurs most of the times is that of William Derham. For example, it may be assumed that the Fröhlich text is also taken from Derham (Book IV., chapter 3., "Of Sound"). In the notes of most of the poems, there are quotations taken from *Phyisco-Theology.* In many cases, Szőnyi borrows the Cicero- and Seneca-quotations from Derham's text. A special feature of Szőnyi's notes is that they are partly in Latin and partly in Hungarian. He refers to Derham's text in some places in Latin, elsewhere in Hungarian. According to our current data, no Latin translation of *Physico-Theology* has been made. Nonetheless, we may even assume that the work would have been translated into Latin in the eighteenth century. It is not unlike that the full text or excerptions were available in manuscript form. It is also possible that Szőnyi made excerptions from Derham's work in Latin during his studies abroad or in an other period of his life. It is a striking feature that the chapter titles of Derham's book are also given in Latin in the Hungarian-language quotations. In addition to several shorter parts, the longest one is a Hungarian-language quotation that contains observations on the transmission of light and sound waves. The source is the fourth chapter of the first book of Derham's work („Of Light") and the third chapter of book fourth („Of Sound"). Derham also compiled this chapter on the basis of the observations of many classical, medieval and early modern scholars. In

Szőnyi refers to Mersennus‘s, Huygens‘s, and Henry Newton‘s experiments. With these quotations and other fragmented translations published in Szőnyi‘s poem collection, he has a significant place in the history of the Hungarian Derham's reception.

Other Hungarian Translations of the *Physico-Theology*

Among the reformers of education, one of the most influential was István Hatvani (1718–1786). Hatvani studied theology, medicine and natural sciences at the universities of Basel, Zurich, Utrecht and Leyden. Between 1749 and 1786, he taught at the Reformed College in Debrecen and worked as a pastor and physician. Along with theology, he taught almost all branches of the humanities and natural sciences. In his autobiography, he mentions that in 1752 he made his sermons on the basis of the French version of William Derham‘s physicotheological work. The manuscript of his translation has not survived. In 1757, Hatvani published a textbook, called *Introductio ad principia philosophiae*. In his work, he publishes a number of accurate astronomical, mathematical, physical, chemical data, partly based on his own measurements and experiments in Debrecen, and partly on the basis of his work in this field. Hatvani proclaims the fundamental views of the physicotheological theory, and refers to the work of Derham and other scholars several times.

Hatvani was among Derham‘s very first Hungarian disciples. In nearly three decades, he has taught thousands of students, many of whom became excellent scientists, writers, poets, economists, and agricultural professionals. One of the most excellent students of Hatvani was István Segesvári (1762–1826). He studied at Kiskunhalas, Debrecen and Kežmarok. In 1787–1788, he was the rector of the gymnasium in Hódmezővásárhely, where the cheaf officer was Benjámin Szőnyi. In 1789, Segesvári enrolled at the University of Vienna Medical School. Later on, he graduated from the University of Pest. From the end of 1795, he was a physician in Debrecen.

In 1793 he was probably still in Vienna, because he published his own translation of the William Derham‘s *Physico-Theologia* this year. István Hatvani and Benjamin Szőnyi certainly encouraged Segesvári to prepare his work. This is evidenced by the fact that the most extensive recommendatory poem was written by Szőnyi. The source of the Segesvári translation was the German version of Johann Albert Fabricius published in 1730. As an addition to his book, Fabricius also published a bibliography of the most important works on physicotheology. This bibliography can be found in Segesvári’s edition as well. The translator supplemented it with additional items, and provided a short, Hungarian description of the books available in Hungarian translation. Segesvári complied a very close translation, an easy-to-read text, in which he found or created adequate versions of foreign-language terms. This was a very difficult task, since the Hungarian language was still in a changing phase. Scientific terms were created independently by the authors, as a standard terminology was not available.

Conclusion

In the second half of the eigtheenth century, physicotheology spread widely in Hungary. The key figures ot the distribution of these ideas, and primarily William Derham‘s works, were

primarily teachers and students of the Debrecen College. The popularity of physicotheology is due to two main reasons. On the one hand, Protestant theologians have found a system of arguments in these texts, which they could well use in the period of recatholization and of the spread of atheist doctrines. On the other hand, there has been a continous increase in susceptibility and in the need for scientific research. It was essential to get to know the work of foreign scientists, as these results could serve as the basis for Hungarian researchers. The translations presented above represents particular cases of the reception of physicotheological ideas. In order to get a more detailed picture of the reception, it would be worthwhile to carry out further research involving a number of unexplored Hungarian-, Latin- and other-language sources.

LIST OF BIBLIOGRAPHIC REFERENCES

ASTON, Nigel. Intellectual challenges and the religious response. In: *Christianity and revolutionary Europe, 1750–1830.* Cambridge: Cambridge University Press, 2002, pp. 93–133.

BOZZAY, Réka. The Influence of Dutch Universities on the Education of Seventeenth-Century Hungarian Intellectuals. In: ALMÁSI, Gábor, ed. *A Divided Hungary in Europe: Exchanges, Networks and Representations, 1541–1699, Vol. 1. Study Tours and Intellectual-Religious Relationships.* Cambridge: Cambridge Scholars Publishing, 2014, pp. 81–100.

DERHAM, William. *Physico-theology: or, a Demonstration of the Being and Attributes of God, from his Works of Creation.* London: W. Innys, 1713.

GILL, Natasha. Educational Philosophy in the French Enlightenment: From Nature to Second Nature. New York–London: Routledge, 2016.

KOOL, Anna Maria. Benjamin Szőnyi and the Szentek Hegedűje (The Violin of the Saints). In: *God Moves in a Mysterious Way: The Hungarian Protestant Foreign Mission Movement, 1756–1951.* Zoetermeer: Uitgeverij Boekencentrum, 1993, pp. 75–89.

KOSÁRY, Domokos. *Culture and society in eighteenth-century Hungary.* Photos by Gábor Barka; translated by Zsuzsa Béres. Budapest: Corvina, 1987.

MICHEL, Paul. *Physikotheologie Ursprünge, Leistung und Niedergang einer Denkform.* Zürich: Herausgegeben von der Gelehrten Gesellschaft in Zürich (Nachfolgerin der Gesellschaft der Gelehrten auf der Chorherrenstube am Großmünster) vormals zum Besten des Waisenhauses 171. Stück, 2008.

ROLLIN, Charles. *De la maniere D'enseigner et D'etudier es Belles-Lettres.* Leyden: J. de Wetstein, 1759.

ROLLIN, Charles, SZŐNYI, Benjámin. *Gyermekek Fisikája, avagy olly szép és hasznos tudomány 'sengéje, Mellyben Kevés példák által meg-mutattatik, mint kellessék szoktatni a' gyermekeket, és együgyü embereket, az Istennek sok féle Teremtéseiröl való kegyes és kedves elmélkedésekre.* Pozsony: Landerer Mihály, 1774.

WARNICK, Barbara. A Minor Skirmish: Balthazar Gibert Versus Charles Rollin on Rhetorical Education. In: HORNER, Winifred Bryan, LEFF, Michael, ed. Rhetoric and Pedagogy: Its History, Philosophy, and Practice: Essays in Honor of James J. Murphy. New York–London: Routledge, 2013, pp. 173–182.